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ON A SUPPOSED CRITERION OF THE ABSOLUTE TRUTH OF SOME PROPOSITIONS

PROFESSOR ROYCE in his address on "The Problem of Truth in the Light of Recent Research," delivered at the Third International Congress of Philosophy at Heidelberg, presents a criterion for the absolute truth of certain propositions which deserves our attention partly on account of the importance of the conclusions reached and partly on account of the peculiarity of the arguments used. After discussing three motives prevalent in recent investigations on the nature of truth, which are called instrumentalism, individualism, and absolute pragmatism, the author says:[1] "*Absolute truth is accessible to man in precisely so far as he can discover what it is that the will must necessarily do,* however capriciously and freely it acts, so long as it retains any kind of rational connection in its life. Now there is but one way to find this out, and that is to discover, unquestionably by experiments in the combination and construction of ideas, what forms of combination and construction there exist such that if you try to suppose them nonexistent, and if you nevertheless keep on acting at all, you inevitably contradict yourself. Exact mathematical research in the realm of the fundamental relations is able to show that the system of these relations has certain absolute forms. The only way to detect these forms is *by attempting to deny that they are present, or that they are what one first sees them to be.* In numerous cases (and these are precisely the cases where definite results can be reached) one hereupon discovers that *to deny certain propositions about these fundamental relations inevitably implies the reassertion of the very propositions denied.* Thus Euclid discovered that the form of the ordinal sequence of the whole numbers is such as to require that there should be no last prime number. This proposition relates to a highly abstract matter, namely, to the type of relationship which characterizes the ordinal sequence of the natural numbers. Euclid

[1] The quotation is from the abstract which was prepared by the author for the use of the members of the congress; the italics are his.

proved this proposition, however, by showing that if one asserted any prime to be the last prime number, one even thereby provided for oneself the means to construct a later prime number, so that the proposition: There is no last prime number, was shown to be a proposition whose contradictory implied the proposition itself which was to be proved. The method here used by Euclid is precisely the one upon whose elaboration, and repeated application, the most significant of the newer researches into the fundamental relations depend. The result is that one finds propositions such that the denial of them implies their truth. Such propositions are thereby shown to be true in precisely the sense which this address declares to be the genuine sense in which we may call truth absolute." Pure mathematics and modern pure logic contain absolute truths in great number.

The argumentation of the author is very clear: A proposition is absolutely true if its denial implies the proposition; this is exemplified by Euclid's proof of the theorem of the "inexhaustibility of prime numbers." Theorems which are proved in this way are, indeed, very frequent in all parts of mathematics. The essential feature of the proof consists in showing that the opposite of the theorem in question involves a contradiction either with one of the principles or with a proposition proved and conceded previously, or with one of the conditions of the problem. In all these demonstrations one concludes, after having successfully shown that the opposite of the theorem in question is false, that the theorem must be true, since only one of two contradictory propositions can be true. These proofs are called apagogical, or indirect demonstrations in contradistinction to the direct demonstrations, in which the theorem is proved by showing how it can be deduced from the principles. Euclid begins his proof of the inexhaustibility of the prime numbers by assuming that this theorem is not true, *i. e.*, that there exists only a finite number of primes. In a finite series of quantities, all of which are different, one term must be greater than all the other terms, and it follows from this that there must be a prime number which is the greatest of all. This consequence, however, implies the contradiction that one can readily find at least one number which is greater than the number that was supposed to be the last prime and which can not be divided by it or by any one of the smaller prime numbers.

The author attributes the character of absolute truth only to those mathematical propositions proved indirectly. It is very natural to ask whether there exists such a fundamental difference between the theorems proved directly and those proved indirectly as would

authorize us to attribute the character of absolute truth to one group of theorems and not to the other. Direct and indirect demonstrations, as a matter of fact, are used promiscuously for the proof of any theorem, except, of course, in cases where the difficulties of the demonstration are so great that only one method of demonstrating could be found until now. This is, however, the case with only very complicated theorems, the truth of which depends so obviously on that of simpler propositions that one certainly will not attribute the character of absolute truth to the complicated propositions if it does not belong to the simpler ones. If a direct proof is given of a proposition which was proved formerly by the indirect method, does it lose its character of absolute truth? This is a pertinent question, since it refers to the very example given by the author. There is not the slightest difficulty in demonstrating the theorem of the inexhaustibility of prime numbers directly, since Dirichlet has discovered the following theorem: An infinite arithmetical series, the first term of which and the difference between two consecutive terms of which are prime numbers, contains an infinity of primes. Euclid's proposition follows from Dirichlet's theorem by direct proof, since the ordinal sequence of the whole numbers is a series such as spoken of in Dirichlet's theorem. It is not always easy to find a direct demonstration of a theorem which is proved apagogically, but it is always a very simple matter to find an indirect demonstration of a theorem which was demonstrated directly. All that is needed for this purpose is to deduce from the opposite of the theorem in question a conclusion which contradicts any one of the propositions constituting the *nervus probandi* of the direct proof. If we give an indirect demonstration of a proposition which was proved directly formerly, do we create an absolute truth by this apagogical demonstration? The author's distinction could be sustained if there were some theorems which can not be proved directly and others which can not be demonstrated indirectly, but it is contradicted by the fact that the two types of demonstrations are used promiscuously.[2]

It is not difficult to see that the difference between direct and indirect demonstration can not possibly constitute a thoroughgoing difference between mathematical propositions. A system of mathematics is the class of all propositions which can be deduced by merely logical processes from a given set of fundamental propositions. From this it follows that the opposite of any such theorem does not belong to this class, *i. e.*, that it is in contradiction to the

[2] The remark that the method of demonstration can not involve a fundamental difference between mathematical propositions, because every theorem which is proved directly can be proved indirectly, was also made by Professor Jerusalem in the course of the discussion following the author's address.

principles. To show that a certain proposition involves a contradiction, or to show that its opposite can be obtained from the set of fundamental principles by deductions involving merely logical processes, is the same. From this it follows that every theorem belonging to a system of mathematics can be demonstrated by apagogical proof. For this reason one can not attribute the character of absolute truth to certain mathematical theorems because they were proved indirectly: absolute truth belongs to all mathematical propositions or to none of them.

The fact that the indirect demonstration of a theorem does not give it prominence among the other theorems belonging to the same system becomes apparent in the case of conclusions drawn from sets of principles which are obviously arbitrary. It is not quite obvious to everybody not trained in modern pure logic that the choice of the set of fundamental propositions of mathematics is more or less arbitrary, as this is best seen from the discussions of non-Euclidean geometry. This difficulty is still greater in the case of algebra, and for this reason the following example was devised. It refers to a set of principles about the logical arbitrariness of which there is not the slightest doubt. Let the set of fundamental propositions be represented by the rules and regulations of the U. S. mail service regarding the acceptance and forwarding of domestic money orders. A man A owes to B the sum of $5.06. B moves to another town, and asks A to send all the money by one money order and to subtract at once the cost of the money order from the original debt. In this case the proposition holds that A can not comply with B's instructions. Let us start from the assumption that our proposition is false, *i. e.*, that A can send the money in the way required by B. If the money is to be sent by one money order, A must send it either at the rate for orders from $2.51 to $5, which is 5 cents, or at the rate of 8 cents for orders from $5.01 to $10. In the first case A would have to subtract 5 cents from $5.06, which leaves $5.01, which is accepted only at the rate of 8 cents; but if A tries to send the money at the higher rate, he has left only $4.98, which is forwarded at the rate of 5 cents. In the first case A is 3 cents short, and in the second case he has 3 cents left. The very supposition, therefore, that A can send the money as instructed by B implies that he can not do it. The proposition is proved indirectly and the author's criterion for absolute truth is obviously fulfilled, but who will be inclined to call this proposition alsolutely true?

Let us see in which sense mathematical propositions may be called true. It may be allowed to follow the presentation of the problem recently given in connection with an inquiry into some of the prob-

lems of psychophysics.[3] Mathematical propositions are derived from a set of fundamental propositions by merely logical processes; these propositions should be necessary and sufficient, which implies that they are independent of each other. The logical truth of a proposition consists in its agreement with these principles, but these principles themselves are logically neither true nor false, because each one of them may be substituted by its logical opposite without contradiction. The logical truth of a proposition refers to a certain set of fundamental principles, and if a proposition is true in regard to one set it certainly will not be true in regard to another set obtained from the first by changing one of the principles necessary for deducing the proposition. From this it follows that the truth of every mathematical theorem depends on the truth of the set of fundamental propositions from which it is derived, and no theorem can be said to be absolutely true since every single proposition, or every group of propositions, or the whole set of propositions from which it is deduced, may be denied. No mathematical proposition possesses absolute truth, since there exists no logical necessity for accepting any system of fundamental propositions. The author's criterion of the absolute truth of a proposition, therefore, can be sustained neither in particular when restricted to propositions which are proved indirectly nor in general when referred to mathematical propositions of every description.

Designating by the letter N a certain proposition, and by M the set of fundamental propositions which are necessary and sufficient to deduce this proposition, then the logical truth of it means merely that "M implies N." This proposition is independent of the acceptance or denial of the fundamental propositions, since the statement "M implies N" refers merely to the logical connection between M and N and contains nothing more than the assertion of the fact that N is a logical consequence of M. Let us apply these results to the two examples given above. We designate by M in the first case the set of propositions necessary and sufficient to deduce the system of ordinary algebra, and by N the theorem of the inexhaustibility of prime numbers. The truth of the proposition N depends entirely on the acceptance or denial of M, but the truth of the proposition "M implies N" is independent of M. Designating in a similar way by M the rules and regulations for the acceptance of money orders by the U. S. post offices, and by N the proposition which states the impossibility of sending the money as required by B, we obtain again the proposition "M implies N," which is independent of the truth of

[3] F. M. Urban, "The Application of Statistical Methods to the Problems of Psychophysics," 1908, pp. 139–179, especially pp. 142–147.

M. The entire system of forwarding money may be changed, but it will remain true that under the given conditions *A* is unable to carry out *B's* instructions. An infinite number of statements of the form "*M* implies *N*" may be made, since *M* may represent any system of fundamental propositions, and *N* any proposition deduced from them, but it seems that the logical process involved is always the same. The fundamental principles of a system of thought state the general qualities of the objects treated of in this system. A single step in a demonstration consists always in showing that a certain object or a certain operation is such as is stated in one of the fundamental principles, from which one concludes that the object must have certain qualities or that the operation is allowable. The conclusion proceeds from the general to the particular. Propositions of the type "*M* implies *N*" contain the assertion of the correct performance of a subsumption, or a chain of subsumptions, a process which implies that there does not exist a logical contradiction between the singular and the general under which it is classified. These propositions do not deserve the name of special truths, since they state merely the requirement to which every proposition must conform in order to be an element of a given system of science.

Abstract systems of science have nothing to do with the existence or non-existence of the objects they speak of, and they become applicable to a certain realm of experience only by the statement that its objects are such as are spoken of in the system applied. Such a statement must be founded on experience, and one tries in vain to deduce the existence of any object from a group of abstract propositions. A proposition is called empirically true if it contains the description of an empirical fact, and a whole system of science is called empirically true if an empirical fact corresponds to every proposition of the system. One may be sure that all the propositions of a system are empirically true if they are deduced from a set of fundamental propositions that are empirically true. In this respect the principle holds that a proposition deduced by merely logical processes from a set of propositions which possess empirical truth is empirically true. Logical truth and empirical truth coincide if the set of fundamental propositions possesses empirical truth.

It is very difficult to make sure of the empirical truth of the propositions which form the basis of those systems of thought which are called empirical sciences in the restricted sense of the word, but it is very easy in those cases where the system of principles is arbitrary. Such cases are very serviceable as illustrations of the difference between empirical and logical truth. There is an infinity of systems imaginable for the acceptance of money orders, all of which

are logically true, but among these systems there is only one which has empirical truth too, namely, the one which is actually in force and which is represented by those rules and regulations with which one has to comply if one wishes to forward money through the U. S. postal service. Every logical conclusion drawn from this set is also empirically true, and the system is complete, since the order will be accepted only in one of the cases provided for by the law. The proposition "*M* implies *N*" will remain true and the character of logical truth of the proposition *N* will be preserved, even if an entirely new set of regulations for the acceptance of money orders should be passed. Our problem will thus retain its humoristic value as a conundrum, which it shares with many a problem of modern pure logic, but the proposition *N* will cease to be empirically true when our man *A* will be able to forward the money as required by *B*.

To attribute the character of absolute truth to the proposition "*M* implies *N*" is equivalent to saying that the principles of logic are absolutely true. To regard every single proposition of this form as an absolute truth increases our stock of absolute truths enormously, though in a somewhat doubtful way, since propositions of this type can be formed not only of the theorems of mathematics, but also of any classification or definition no matter how arbitrary it may be. Let a definition be given in the form $A = abc \ldots$ then each one of the propositions "$A = abc \ldots$ implies A is a;" "$A = abc \ldots$ implies A is b," . . . must be called absolutely true. The definition may be perfectly arbitrary, but the truth of the implication does not depend on the acceptance or denial of it. In a similar way let us designate by the letter *M* the lemma "*A* is either *a*, or *b*, . . . or *n*," then each one of the propositions "*M* implies, *a* is *A*," "*M* implies, *b* is *A*," . . . is a proposition the truth of which does not depend on the acceptance of the lemma. These examples show clearly that the formal character of all these propositions is the same and that their truth is identical with that of the principles of logic.

The principles of logic are, therefore, the only propositions which regard abstract systems of thought and the truth of which is independent of any supposition. They may be said to be absolutely true in so far as no proposition of an abstract system must contradict them, but there remains the problem why phenomena of actual experience also must comply with them. This is required by the above-mentioned principle that a proposition deduced by merely logical processes from a set of empirically true propositions must be empirically true. We may express it in short by asking how the principles of logic come to have empirical truth. This question

refers to the problem why the laws of thought are also the laws of things, a problem the solution of which is begged if one declares the principles of logic to be absolutely true.

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THE TRUE GOD OF SCHOLASTICISM

IN the celebrated work on "Pragmatism" of our distinguished psychologist and philosopher, William James, we read the following lines: "Old fashioned theism was bad enough, with its notion of God as an exalted monarch, made up of a lot of unintelligible or preposterous attributes; but so long as it held strongly by the argument from design, it kept some touch with concrete realities. Since, however, darwinism has once for all displaced design from the minds of the 'scientific,' theism has lost that foothold; and some kind of an immanent or pantheistic deity working in things rather than above them is, if any, the kind recommended to our contemporary imagination. Aspirants to a philosophic religion turn, as a rule, more hopefully nowadays towards idealistic pantheism than towards the other dualistic theism, in spite of the fact that the latter still counts able defenders" (p. 70).

Speaking about traditional theism, Professor James had already said: "It is the lineal descendant, through one stage of concession after another, of the dogmatic scholastic theism still taught rigorously in the seminaries of the Catholic church. For a long time it used to be called among us the philosophy of the Scottish school" (pp. 17, 18).

And a few lines further he gives the following description of the "theistic God": "You have to go to the world which he has created to get any inkling of his actual character: he is the kind of God that has once for all made that kind of a world. The God of the theistic writers lives on as purely abstract heights as does the absolute. Absolutism has a certain sweep and dash about it, while the usual theism is more insipid, but both are equally remote and vacuous" (pp. 19, 20).

On reading these lines, the student of post-Kantian philosophy is at once reminded of Hegel's sharp attack on the God of old metaphysics. Like William James to-day, the author of the "Logik" had told us of a metaphysical system in which "the terms of thought were cut off from their connection, their solidarity"; of a system in which a knowledge of the absolute was supposed to be gained by

assigning predicates to it. The Swabian thinker, however, had prudently abstained from giving us the names of his pre-Kantian dogmatists. With less circumspection, or perhaps more self-reliance, Mr. James speaks of the Scottish school, which he regards as the direct, legitimate, and pallid offspring of old scholasticism.

I believe that, in the assignation of such a parentage, an injustice is done to the medieval theologians; and I will, therefore, step forward and venture to defend their God, that old scholastic God, so little studied to-day, yet so great, as of old.

It is no doubt true that scholastics love to expatiate on the attributes of the Deity. Thomas Aquinas, after demonstrating the existence of a Supreme Being, studies him in his goodness, his infinity, his immutability, his eternity, his omniscience, his will, etc. It seems, indeed, that we are in the presence of a bundle of attributes, of a sheaf of perfections, bound together by we know not what tie. Let us not, however, stop at the surface of St. Thomas's thought. Let us enter deep into the pure waters of his doctrine, so as to commune, as it were, with his mind, and bring our heart and our soul in unison with his own. Nowhere more than in philosophy is a cursory judgment fraught with dangerous consequences.

The Angelic Doctor repeatedly discusses the question whether names may be applied to God. He is of opinion that they may; but he warns us against the pretension of describing thereby God's essence. Words, he says, refer to things, by means of the conceptions of the intellect. Just in so far as our intellect can know, it can also name. But as in this life we have no intuition of the Divine Essence, and can know God only from his creatures, we can name him from his creatures, but are incapable of expressing his essence by words.[1]

It follows therefrom that a plurality of names is not incompatible with the simplicity of the Divine Essence. All perfections found in created things may be said to exist in God as effects exist in their equivocal causes. Such effects are not in their causes formally, but virtually. The sun produces a variety of effects in our world. It is the cause of heat, of drought, of life, of death. It makes plants grow; it makes them wither. Now it brings verdancy to our meadows; now it parches the grass of our lawn. And the great luminary might be thus diversely described. It is, notwithstanding, one single and identical sun. So it is with God. We love goodness in the things that surround us: we attribute such a goodness to their creator as their primary cause, and call him the good God; we admire the power of nature and the power of man: we know that this power comes from the maker and sustainer of man and nature,

[1] *Cf.* Thomas Aquinas, S. Th. 1, XIII., 1, c.

and we call him the all-powerful; we admire the wisdom of our sages and call God omniscient. But this God, which we describe as good, and powerful, and wise, is essentially simple. His essence is his very being,[2] his intellect is his very being;[3] his will is his very being.[4] There is in him no composition of quantitative parts, because he is not a body;[5] there is no composition of matter and form,[6] no composition of genus and differentia,[7] no composition of subject and accidents.[8] He is absolutely simple: *Deus est omnino simplex.*

Let us now pass to the question of the creation of the world, of that world which, Mr. James assures us, the theistic God "made once for all," after which he went to rest in "those purely abstract heights," where he now lies "remote and vacuous."

No doubt many Christians conceive creation after the manner of an event that took place in time. They regard God as a big and worthy gentleman, who led at first a solitary life; but who, on a certain day—a little more than sixty centuries before this blessed year of our Lord 1908—suddenly made up his mind to create the earth, the sun, the moon and the stars, the animals and man. And, since that day, he lives in some remote and unknown place, somewhere beyond the stars, while the world goes its own way by itself, with its joys and sorrows, its virtues and vices, its heroic deeds and its diabolical perversity. Such a naïve theology has undoubtedly existed. I know more than one Catholic lady who, even to-day, would defend it tooth and nail. Fresh in our memories are the beautiful verses of the great French lyric:

> Lorsque du Créateur la parole féconde
> Dans une heure fatale eut enfanté le monde
> Des germes du chaos,
> De son œuvre imparfaite il détourna sa face,
> Et, d'un pied dédaigneux, la lançant dans l'espace,
> Rentra dans son repos.

It would be, however, sovereignly unjust to connect the sublime genius of Aquin with this short-sighted theological system. Nothing is farther from his thought than the conception of God's duration as an infinite series of successive instants.

Whenever we perceive succession, he argues, whenever one element of a whole follows another element, there arises in our mind the idea of time, which is the measure of motion. An immutable

[2] *Ibid.*, I, III., 4.
[3] *Ibid.*, I, XIV., 4.
[4] *Ibid.*, XIX., 1.
[5] *Ibid.*, III., 1.
[6] *Ibid.*, III., 2.
[7] *Ibid.*, III., 5.
[8] *Ibid.*, III., 6.

being, on the other hand, exists in a state of perfect uniformity: it is not temporal, but eternal. Eternity does not, therefore, mean simply the absence of beginning and of end: it also and chiefly means the absence of succession. Eternity is a perennial present.[9]

We are now in a position to understand how absurd it would be to speak of God as having created the world sixty or more centuries ago. Now he is and now he creates the world.

A striking confirmation of this view may be derived from the scholastic doctrine of preservation. The creation of the world was so little a thing, "made once for all," that it must be continued through every instant; and, should it cease for one moment, the world would be instantly annihilated. There are, St. Thomas teaches, two kinds of preservation: the one, indirect and accidental; the other, direct. Indirect preservation occurs when the action of the agent is limited to the remotion of the destructive causes; and thus a mother may be said to preserve her child when she prevents him from falling into the fire. It is not thus that God preserves the world. He preserves it directly; which means that the world depends upon him and could not persist in existence without his preserving action. God's action upon the world may be compared to the way in which the sun illumines the air. The air participates in the light of the sun, although not in its nature. It remains luminous as long as the sun continues shining and falls back into darkness as soon as the great luminary disappears.

And this preservation of the universe is not a new action, numerically distinct from the creative fiat. It is the very act by which God gave—or rather gives—existence to the world.[10]

It may be objected, however, that, in the preceding paragraphs, we have considered the world from God's point of view. What if we should consider it from the point of view of man? If we go back through the series of centuries that have preceded our own, shall we reach a true beginning, a first instant before which nothing was? or will our series be infinite? Could we assign a date to the creation? Did it take place in time, or is the world "eternal"?

In his "Critique of Pure Reason" Kant gives the following profound definition of the Divine Being: "The necessary condition of the absolute totality of the series of phenomena";[11] and he adds: "The existence of such an absolutely necessary being may be impossible; but this can never be demonstrated from the universal contingency and dependence of sensuous phenomena, nor from the principle which forbids to discontinue the series at some member."[12]

[9] *Ibid.*, 1, X., art. 1.
[10] *Ibid.*, 1, CIV., art. 1.
[11] Bohn's ed., p. 286.
[12] *Ibid.*, p. 347.

According to Kant, God is not, therefore, to be regarded as the first link in the chain of phenomena. The phenomenal series is not to be conceived as a limited straight line which comes from God: it may be regarded as a circular series, in which each phenomenon depends upon the preceding phenomenon, but is at the same time necessarily conditioned by an absolutely necessary being.

In ancient Greece, Aristotle had already studied the Divine Being from the same point of view; and it is a glory for Thomas Aquinas not to have departed from it during the Middle Ages. Whenever the Angelic Doctor studies the question in the light of natural reason—the only source of truth with which philosophy is concerned—he reaches conclusions to which the author of the "Critique" would unhesitatingly subscribe.

According to St. Thomas, human reason is unable to decide whether the universe had a beginning or not. The Angelic Doctor does not, however, deplore the fact too deeply. He teaches that, in so far as the relation of the world to God is concerned, the question of the world's age is devoid of all significance. Creation is not a motion; it is the dependence of created things on their creator; a dependence with which time has nothing to do. It is not to the genus action or passion, but to the genus relation that creation belongs.[13]

And this is why philosophy can not give any valid proof of the finiteness of the temporal series. Why, asks St. Thomas, should the world have had a beginning? It can not be on account of the world's own nature, because the nature of a thing is independent of time and place *"unumquodque secundum rationem suæ speciei abstrahit ab hic et nunc";* it can not be on account of the nature of the creator, because the world depends upon the will of God; and the will of God can not be investigated but with regard to the things which God wishes necessarily. It can not be said that God, being the cause of the world, must have existed prior to his effect, because the doctrine of the temporal priority of the cause holds true only of causes which act through motion. Whenever the causal action is instantaneous, it is not necessary that the cause should precede the effect in time, as may be clearly seen in the fact of illumination.[14]

Not only is it not necessary that God should have existed before the world: it is absolutely impossible. Being outside of all succession, God can neither precede nor follow; the words "before" and "after" have no meaning when applied to him. God is: the temporal series will be finite if he wishes it to be so; it will be

[13] *Cf.* Thomas Aquinas, "Contra Gentiles," Sect. 11, c. 18.

[14] *Cf.* Thomas Aquinas, "Summa Theol.," 1, XLVI., art. 2.

infinite if the infinitude of time is more in harmony with his will; but, in either case, God will be outside of the series; he will not, therefore, precede time.

And, after expounding so splendid a theory, St. Thomas proceeds to refute the objections by which it may be assailed.

If the world had always existed, some one might object, it would be equal to God in duration; but no creature can be equal to the creator in any respect; therefore the world has not always existed.

This objection, St. Thomas answers, is based upon a total ignorance of the nature of eternal duration. The essential difference between time and eternity does not lie in the fact that time had a beginning, while eternity has none. It consists in the element of succession, the presence of which constitutes time, the absence of which constitutes eternity. If the world has always existed, it is, therefore, as properly temporal as if it had been created some centuries since.

But, the objector will rejoin, if the world has always existed, its history up to the present time covers an infinite number of years. As an infinite number, however, can not be completed, the number of years that constitute the past history of the world is finite and the world had a true beginning in time.

This reasoning, observes St. Thomas, is as decidedly puerile as the first. The objector unconsciously marks out a certain point in the past history of the world and computes the number of years that have elapsed between this point and the present moment. If we want to find out the true age of the world, we must not, however, start from some illusory beginning when no such a beginning exists. A completed number of years can not be conceived but between two definite extremes. But, if the world had no beginning, the only extreme from which we can start is the present moment; and we then clearly conceive that the temporal series is indefinite in either direction: indefinite in its future, indefinite also in its past.

And yet, St. Thomas admits that the world had a true beginning. Philosophy had furnished him serious reasons for believing in the infinitude of the temporal series; it had been, however, incapable of leading him to a definite conclusion. Holy Scripture then steps in and furnishes her own proof of the youth of the world. She imposes her conclusion on St. Thomas's mind. The philosopher bows down his head and the theologian wins the day.

To what extent the finiteness of the temporal series tallies with the Thomistic system as a whole, I will not here discuss. I will also refrain from examining the intrinsic value of the proofs drawn from Holy Scripture. I confess myself incompetent in theological

matters, and I know too well how liable to err is the man who ventures upon the field of a science in which he has not been trained.

Moreover, we have seen how unimportant the question is in so far as the nature of the creative act is concerned. It is unimportant also with regard to the state of essential dependence which is the unceasing condition of the world. It is this dependence that constitutes creation. It is this dependence that requires and explains Providence.

So far from being "remote and vacuous," the Thomistic God constantly watches over all his creatures, over the sinner and over the just, over each single drop of water of the ocean as well as over the angels of heaven.

For such is, indeed, the Thomistic doctrine of Providence. Providence has been defined as the wisdom whereby God directs things to their proper ends. According to St. Thomas, this wisdom necessarily exists in God. All the good that is found in things, he argues, must be attributed to God. But good is found in things not only with regard to their nature, but also with regard to their ultimate end and to the means whereby they are enabled to attain it. As the wisdom of God is manifested in the nature of things, it must be manifested also in his directing them to proper ends by proper means. It is in this directing action that Providence consists.[15]

This Providence, St. Thomas continues, is not limited to a general supervision of the world's events. God is not a general manager who directs his business from the distance, while subordinate officers mind the details. He takes care of the minutest events of the world. Not even the most insignificant act of ours can exist without his permissive will and his actual concurrence.[16]

We may concede to William James that the scholastic God is, in many respects, unlike the God of pragmatism. Whether the pragmatist conception has been a real progress in the understanding of the divine nature is an interesting question upon which I will not touch. I shall be satisfied if the preceding considerations have brought home the truth that the scholastic God, "the God of earth and heaven, can surely be no gentleman. His menial services are needed in the dust of our human trials, even more than his dignity is needed in the empyrean."

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[15] *Cf.* Thomas Aquinas, "Summa Theol.," 1, XXII., art. 1.
[16] *Ibid.*, art. 2.

REVIEWS AND ABSTRACTS OF LITERATURE

Zur Klinik der Dementia Præcox. WIEG-WICKENTHAL. Carl Marhold Verlagsbuchhandlung. 1908. Pp. 121.

In view of the wide attention recently attracted to the problem of dementia præcox through the studies of Meyer and Hoch in this country, as well as the more fanciful speculations of a section of European psychiatry, this presentation of the matter from a more Kraepelinian view-point is far from untimely. The material is based upon that coming to the author's personal notice during the past four years, as well as the terminal stages of earlier cases; twenty-one histories are quoted, several in great detail. The fundamental criteria of the disorder are the volitional disturbances and apparent emotional incoordinations, but especially the characteristic terminal condition. First comes the group of cases, usually not difficult of recognition, which after an apparently normal childhood and adolescence sink into dementia without any symptoms of a very positive character (*dementia simplex*). In the remaining forms the fading of the personality is accompanied by a varying amount of distortion; the hebephrenic form usually gives in the beginning a picture most resembling the excited phase of manic-depressive insanity, in the catatonic form the purely motor symptoms are the most prominent, other cases are most marked by paranoid traits. Into this tripartite classification the similar conception of normal mental faculties has to a certain extent woven itself; the paranoid forms representing an affection of the cognitive, the hebephrenic the emotional, and the catatonic the volitional aspects of mental activity. The author tends, however, to a narrower conception and a greater multiplicity of clinical varieties, defining the groups more sharply, though recognizing the continuum between all. He further distinguishes a group with hysteriform-neurasthenic prodromata, a depressive-paranoid form, a form beginning with an acute confusion picture, and the intermittent cases. This multiplicity of forms is perhaps of more psychological than clinical interest, for it has little effect on the prognosis, save in so far as one might find a favorable element in the remissions. If any distinction is to be made, the catatonic form probably has the best prognosis, and the depressive-paranoid form the worst. In this connection it may be remarked that the author hardly lays sufficient stress on the wide variations which the terminal conditions present. These may range from the (superficially) completely vegetative condition also seen in the later periods of general paralysis or in the profound idiocies, to a slight even if distinct residuary deficiency, leaving the patient with a considerable fraction of his mental powers preserved. Such individuals are frequently able to attain a relative independence in a humbler place in life than that which they originally held.

The author's most important deviation from Kraepelin seems to be in the matter of the paranoid forms of the psychosis. To dementia paranoides he accords but brief mention, and is inclined to relate it more

closely to true paranoia than is perhaps justifiable. It is true that early differential diagnosis may often be very difficult, but this is very far from implying, as the author does, the essential unity of the cerebral process in all paranoid psychoses, whatever their origin, course, and outcome. For prognostic purposes the author would, however, restrict the term dementia paranoides to those cases beginning with senseless fantastic delusions, mainly of a grandiose type, which lead rapidly, say within a few months, to the characteristic dementia. The rest are to be called paranoia, whether they ultimately dement or not. This is hardly a satisfactory psychological conception of the clinical facts; the paranoid psychoses can not be so closely limited to any special disease states.

A more satisfactory treatment is that of the group of cases to which the term *depressiv-paranoide Form* is applied. Such cases, perhaps, form the majority of these dementing psychoses, and are especially common among women (to whom, by the way, the author's personal material is largely restricted). They rest upon the fundamental three symptoms, (*a*) hallucinations of depressive, minatory content, (*b*) ideas of reference, (*c*) *hypochondrisch-nihilistiche* delusions and fears. Upon a subacute or even acute period of paranoid hallucinations and delusions, in which auditory hallucinations of a shameful and persecutory character preponderate, together with an anxious depression that may lead to attempts at suicide, succeeds a progressive dementia exhibiting the essential characteristics of the dementia of the præcox psychoses. Its nearest congener in the previous literature is the dementia tardiva of Stransky, so called apparently because the majority of his cases were well along in life; Kraepelin has also found that the paranoid forms of dementia præcox are proportionately more common in later life than the hebephrenic or catatonic. To apply the name of præcox, however, to a depression which dements as late as forty or later, is not a diagnostic practise that every clinician will allow to pass unchallenged. It is interesting that these cases almost always came to observation under the diagnosis of amentia or melancholia (manic-depressive depression?), but the author holds the former diagnosis to be almost inexcusable in the presence of good orientation, seldom if ever lacking in these cases; in the latter case he seems to reason that the *active* melancholias of the manic-depressive type belong rather to a more advanced age than is usually met with in these cases; an agitated depression in a youthful subject therefore throws the balance of probability in favor of dementia præcox.

A number of cases ending in the characteristic terminal stage begin with attacks resembling those seen in hysterical and neurasthenic states, and differential diagnosis in these cases is often among the most difficult of clinical problems. The author devotes a considerable chapter to these conditions, with many striking histories, whose interest, however, is almost wholly clinical, from which his conclusions may be briefly translated as follows:

1. The hysterical psychoses proper . . . are quite rare during the period of adolescence, in contrast to those of dementia præcox; after the twenty-fifth year the hysterias again increase in frequency.

2. Every acute or subacute psychosis with hysteric or neurasthenic characters appearing in a patient previously healthy and with neither degenerative predisposition nor hystero-neurasthenic antecedents, points to dementia præcox, especially if ushered in by a stuprous or violent condition (catatonia).

3. An early differential diagnosis is often impossible in such hysteriform conditions, because both groups of diseases, at least in the earlier stages, may exhibit purely functional (volitional) disturbances, aside from any clearly evident dementia or dissociation.

4. In the cases beginning with neurasthenic symptoms, the slight apathy and loss of interest, in marked contrast to the behavior of the true neurasthenic, speaks for dementia præcox.

The group of cases beginning with an acute confusion picture are taken mainly from Kraepelin's catatonias, and the main point raised is the not unfamiliar one of real or apparent confusion. The cases under the intermittent group are quite interesting. The individual exacerbations are not necessarily of a similar character. We have to do here with a psychosis that begins, say, with a confusion picture that may clear up to a considerable extent only to be followed by a second, perhaps a catatonic, which may be later followed by a hebephrenic attack which does not remit, but runs its course to the terminal dementia. Each attack will show the symptoms characteristic of a beginning præcox case of that type, save that the dementia is postponed, but when it does occur it is characteristic. Where there is an alternation of the hebephrenic and catatonic states the analogy to the manic-depressive group is quite striking, save that the manic-depressive cases recover, while there is in the præcox cases probably a slight mental defect in each remission, growing more marked with the successive attacks. This form of the psychosis, according to the author, is also especially frequent among women.

Wieg-Wickenthal's view-point being mainly a clinical one, he touches only incidentally on the psychology of the disorder, and makes no attempt to go beyond the clever analyses of Erwin Stransky. These, it will be remembered, refer the essence of the dementia præcox state to an ataxia of the cognitive and affective elements in the individual's life. The patient's experiences no longer call up the affective qualities ordinarily associated with such experiences, but stronger, weaker, or incongruous ones. Behavior naturally suffers accordingly; hence the smiling indifference to the most serious situations, coupled with the causeless outbursts of catatonic fury. This theory rather runs counter to the best conceptions of the nature of emotion, and it may be questioned whether, since the value of such analysis is at best wholly descriptive, we should not meet the known facts of the situation better by substituting *reaction* for *affect*. The ataxia concept is an excellent one, but we hardly know enough of the emotional life of these cases to make this an element of psychological analysis. Clinical observation infers the emotional condition from the outward behavior of the individual in certain more or less elementary situations. We speak of the individual as apathetic because

his motor responses are of a sort usually associated—rightly or wrongly—with an apathetic affective reaction in normal individuals. It is a commonplace, however, that the emotional value of a situation is far less fundamentally given in the outward and visible reactions to it than in the organic processes with which it is associated; whether as cause or effect is here beside the point. Inasmuch as the character of the psychosis largely limits the value of introspection, it is probable that the organic processes should afford as reliable an index of affective values as can be obtained in these cases. No reliable data on this point are as yet at hand. A few observations with the much-abused galvanometer are reported; the writer has observed a terminal dementia præcox, mute and catatonic during many years, whose reactions to ordinary affective stimuli did not differ in any superficial respect from those of a certain perfectly clear, highly refined and educated psychasthenic. Wieg-Wickenthal himself indicates something of this sort in the summary of his remarkable case 5, where he speaks of a "stuporöses Verhalten mit pathetisch posenhaftem, von *einem lebhaften Innenleben zeugendem*[1] (?) Gebaren . . . P. lacht verzückt, betet, ist teilweise ängstlich." Jung also has strongly emphasized the insufficiency of our present criteria of emotional states in dementia præcox; and it is doubtful if we can yet assume any more fundamental ataxia than that of noopsyche and, let us say, ergopsyche; a failure of the adequate reaction, in and for itself.

This conception may be helpful in understanding the basis of the differentiation of the clinical picture in certain initial stages of dementia præcox and the profounder confusions of the manic-depressive type. The essential point is, as Wieg-Wickenthal and others have brought out, that the disordered behavior of the manic-depressive case is the direct response of a normal reaction to the variety of delusions, occasionally hallucinations, constituting the immediate mental basis of the disorder; the impulsive acts in dementia præcox, on the other hand, are unmotivated, and take place in the presence of good orientation and relatively little clouding of consciousness. In the former case the normal relation between situation and reaction is preserved relatively intact; the subject reacts more as a normal individual might react if placed objectively in the same situation which the disease thrusts upon him subjectively; noopsyche and the other elements are coordinated, but noopsyche is perverted. In the præcox condition, on the other hand, both the noopsyche and the mechanism of the end effects may be largely preserved; but the one is no longer capable of properly discharging into the other. Thus the clinical, and, it may be added, the experimental problem is largely a determination of the existence and amount of confusion.

It is some two years since Adolf Meyer called attention to the fallacies to which the study of mental diseases in general, and dementia præcox in particular, was liable in taking general paralysis as the paradigma of mental diseases. Wieg-Wickenthal not only takes general paralysis as the paradigma, but throws dementia præcox into parallel column with

[1] The italics are mine.

it; the closeness of the analogy which he attempts to draw between them is quite striking. He is unequivocally in favor of the intoxication hypothesis in dementia præcox; *cf.* on page 104, where he says: "Die angedeutete Aehnlichkeit bezüglich der Mannigfaltigkeit der Verlaufsweisen der paralytischen Psychosen und der Dementia præcox findet ihre Ergänzung in weiteren Berührungspunkten insofern, als uns nach neuerer Auffassung sowohl die paralytischen als auch die Dementia præcox-Psychosen nur als Teilerscheinungen einer allgemeinen, tiefgreifenden *Stoffwechselstörung,* die im Gehirne sowohl als auch in anderen Organen greifbare, organische Veränderungen hervorrufen, entgegentreten."

Again on page 50 he draws a sharp distinction between the functional psychogenic character of hysterical disturbances and the dementing processes in dementia præcox, though acknowledging that the latter may often be seen ensuing upon the former; to this extent only will he speak of *Mischformen* between hysteria and dementia præcox. But while it is often the practise to speak of hysteria as a functional disorder *par excellence,* yet the present writer is by no means sure that it is not better to regard this sort of function as mainly a name for what we do not know about structure. However, be the actual disease process in dementia præcox one of intoxication or of disordered anabolism or catabolism—they are all one essentially—this helps us very little toward a better understanding of fundamental genetic and etiological questions. Even admitting that, as has been recently suggested, the symptoms of dementia præcox appear with startling frequency upon the soil of a specific and well-defined temperament and way of dealing with mental situations, their etiological relationship is at present a matter for the individual conscience. Few, indeed, will be found to express belief in a dementia præcox the product of *purely mental* causes,

> "Ef *tangles* shud settle it (horrid reflection!)
> Wich of our onnable body'd be safe?"

Various clinical, and certain experimental, observations may be cited in support of the view that the psychogenesis plays in characterizing the dementia of dementia præcox a role far more important than it plays in the dementia of, say, general paralysis; but in either case the mental factor contributes to the clinical picture only the color, not the outline.

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JOURNALS AND NEW BOOKS

THE PHILOSOPHICAL REVIEW. September, 1908. *The Alleged Fallacies in Mill's Utilitarianism* (pp. 469–488): JAMES SETH.—"All that is necessary in defense of Mill from the charge that he has fallen into fallacies which are patent to the veriest tyro in logic, is to interpret his argument in the light of its context and of the purpose the author has in

view. *The Agent and the Observer* (pp. 489–506): WARNER FITE. – Compares the way a thing feels when you do it yourself, and the way it looks when you see it done by another. The observer explains conduct by showing causes, the agent by alleging purposes. Each point of view is partial and abstract, and the results of the abstraction are seen in such relatively artificial concepts as economic man, reproductive man, etc. *Neo-Realism and Idealism* (pp. 507–517): E. H. HOLLANDS. – A criticism of the epistemology of contemporary realism. The realists confuse idealism with subjectivism. Subjective idealism starts with relations and tries to arrive at reals, an abstract procedure. Equally abstract is realism, seeking to start with reals and arrive at relations. *Happiness as an Ethical Postulate* (pp. 518–528): W. K. WRIGHT. – Happiness can be called an ethical postulate when defined with sufficient care. "Happiness, as a moral conception . . . is restricted to that state of consciousness in which a man is true to his moral ideal and receives the approval of his conscience." *Reviews of Books:* John Watson, *The Philosophical Basis of Religion:* A. K. ROGERS. Erich Becher, *Philosophische Voraussetzungen der exakten Naturwissenschaften:* E. A. SINGER, JR. Georg Simmel, *Schopenhauer und Nietzsche:* C. M. BAKEWELL. Josiah Royce, *The Philosophy of Loyalty:* FRANK THILLY. *Notices of New Books. Summaries of Articles. Notes.*

REVUE PHILOSOPHIQUE. October, 1908. *Les problèmes actuels de l'instinct* (pp. 329–369): H. PIÉRON. – The development and discussion of the definition of instinct as an innate tendency to categories of specific acts, attaining at once and without preparatory experience their maximum of perfection, taking place in certain conditions of environment and presenting a relative dependence with respect to circumstances, but too rigid—if not in the details, at least in their general character—to admit a plastic adaption to new factors. *L'énergie potentielle est elle une réalité?* (pp. 370–389): KOZLOWSKI. – Potential energy is only an hypothesis of science. Reality belongs to force alone. *Anti-pragmatisme. II. Pragmatisme et vérité* (pp. 390–409): A. SCHINZ. – Pragmatism, as new scholasticism, is a fashion of affirming traditional beliefs necessary to humanity. Its life is therefore due to the fact that it is desirable, but "pragmatists insult truth." *Revue critique:* E. Meyerson, *Identité et réalité:* A. PENJON. *Analyses et comptes rendus:* Albert Leclère, *La morale rationnelle dans ses rapports avec la philosophie générale:* A. PENJON. C. Bouglé, *Essai sur le régime des castes:* S. JANKELEVITCH. Cruet, *La vie du droit et l'impuissance des lois:* J. LAGORGETTE. Lalo, *Esquisse d'une esthétique musicale scientifique:* L. DAURIAC. J. Ingegnieros, *Le langage musical et ses troubles hystériques:* L. DAURIAC. *Revue des périodiques étrangers.*

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Boutroux, Émile. *Science et religion dans la philosophie contemporaine.* Paris: Flammarion. 1908. Pp. 400.

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Metchnikoff, Elie. *The Prolongation of Life.* Translated by P. Chalmers Mitchell. New York: G. P. Putnam's Sons. 1908. Pp. 334. $2.50.

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NOTES AND NEWS

We take the following from *Science* for December 4: "The Scientific Association of Johns Hopkins University held the first monthly meeting of the present scholastic year in Hopkins Hall, November 11. Two important papers were presented. The first was by Professor J. B. Watson, the newly-elected professor of experimental and comparative psychology, upon the subject of "Methods and Apparatus in Comparative Psychology." Professor Watson gave a brief description of the nature of the problems in comparative psychology. The position was taken that the behavior of animals can be studied in a scientific way; that the facts thus obtained can be stated objectively and that they deserve to have equal rank with other observations in experimental psychology and in biology. The view was expressed that the study of the sensory processes of animals is the most hopeful field at present. Exact and scientific statements concerning the nature of color vision, hearing, smell, contact, etc., in animals are much needed. At present almost nothing is known in any exact way of the functioning of the sense organs of the higher animals. Such studies should be undertaken in a more comprehensive way than has heretofore been the case. Observations made by the same investigator on many species of animals are desirable at present. Only in this way can a true phylogeny of mind be obtained. When the facts are before us we shall be in a position to begin the comparison of the behavior of animals with the behavior of man. Several pieces of apparatus for testing hearing, vision, temperature, etc., were briefly described. A description of an apparatus for the study of olfactory sensations was given at length. The principal feature of this apparatus consists of a constant air blast supplied with two vents. Two leads of glass tubing attached to these vents pass respectively into two flasks containing different odorous solutions, or different intensities of the same solution, and from the flasks to short metal tubes which project into a glass-lined, air-tight compartment. The ends of the two tubes protruding into the

compartment are narrowed to an opening of 1 mm. The tubes are placed about twelve inches apart and are inclined at an angle such as to force the two streams of air, laden with the olfactory particles, to converge in a funnel situated in the opposite side of the compartment. To the stem of this funnel (which projects from the compartment) a tube is attached leading to a vacuum pump. Two fine streams of air are thus forced out over the surface of the odorous fluids and thence into the compartment. At the same time the vacuum system at the opposite side of the compartment tends continuously to draw forward the two streams and to keep them in a straight line. Two partitions of glass extend from the side of the compartment through which the two streams are admitted. They run parallel to the air columns, meeting near the point at which the latter converge. The animal is admitted into the compartment at the point where the partitions meet. These partitions serve to keep the odors from mixing. Food is kept always with one of the two odors. The tubes and flasks are so arranged that they may easily be interchanged with respect to the right and left position. The animal has to go first to the right in order to get food, and then after the odors are interchanged, to the left. In the final control tests a special electric food dropping device serves to keep all food out of the compartment until the animal has actually made the correct choice. The hope was expressed that, with the help of such an apparatus, much needed knowledge concerning the development and the manner of functioning of the olfactory sense organ might be obtained. It ought to be possible, *e. g.*, to find out whether the animal is sensitive to all the range of stimuli to which the human organism responds, and how far animals differ in this respect: whether or not it is easier for the animal to associate the *nauseous, hircine,* and *fecal* odors with the getting of their food, than the *fruit, flower,* and *musk-like* odors, etc. The quantitative study (delicacy) of the functioning of this sense offers great difficulties, but it is hoped that these can be overcome, at least to such an extent as to enable us to obtain records which may be compared with similar records from man. Functional problems similar to those which arise in the study of the olfactory field arise in the study of every other sensory field. Experimental psychology is recognizing this and is rapidly coming to extend its study of sensory processes to the animal world. There is no reason to limit experiment along these lines to man alone. Such functional questions when answered will give us the much-needed complement to all the painstaking and exact structural work which has already been accomplished so abundantly."

THE list of those who will take part in the discussion of realism and idealism at the forthcoming meeting of the American Philosophical Association, at Baltimore, includes Professor Royce, of Harvard, Professors Dewey and Woodbridge, of Columbia, Professor Bakewell, of Yale, and Professor Smith, of Princeton. The presidential address will be given by Professor Münsterberg, of Harvard, on the "Problem of Beauty."

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ERRATA

Page 152, line 12 from top, for "move," read "nerve."
Page 477, lines 3, 5, 12 from bottom, for "Fitzpatrick," read "Kirkpatrick."
Page 527, line 7 from end of review, for "aware," read "unaware."

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